GOITER IN THE GREAT BASIN

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From the standpoint of incidence of goiter, Utah and the contiguous States show a great variation in their widespread, sparsely settled territory. Thus, in the Virgin Valley of Southern Utah, it is so common that fully 75 per cent of the women have some form of thyroid enlargement, and because of the isolation of that part of the State some of these women have enormous goiters, which they carry to their graves untreated.

In the Salt Lake Valley, on the contrary, although goiter is present, it is a relatively uncommon condition.

In geological times, a considerable area of the Great Basin was occupied by an immense inland sea. At first this was a fresh water body larger than Lake Michigan, with an outlet into Snake river probably as large as the Niagara river. But as aridity of climate developed, the outlet was cut off, and the great lake became saline. The Great Salt Lake is the remnant of that once mighty inland sea.

Considering the distribution of goiter as a world problem, it does seem that the proximity of saline waters confers comparative immunity. As one follows the narrowing periphery of the great prehistoric body of water which once occupied these mountain valleys, the incidence of goiter gets less and less the nearer you approach the vanishing point, which is the Great Salt Lake. This is no doubt due to the fact that salt, as it occurs in nature, nearly always carries a certain percentage of iodine, and the saline content of soil, and of vegetables that grow from soil, increases as you approach their most recent deposit.

Whatever the cause of goiter, whether iodine deficiency or the presence of iodine reducing bacteria, Utah furnishes abundant evidence that it is associated with drinking water.

I know personally of two families, in parts rather widely separated, in each of which two girls had reached their later teens without developing goiter, but in each of which goiter rapidly developed when they changed their abode only a few miles and went into a goiter district for the purpose of attending school.

In St. George, a town of Southern Utah, with a population of approximately 3000, goiter was quite unusual for more than half a century from the time of its founding, until a water system was installed and the Cottonwood water diverted from the Pine Valley Mountains. Since the advent of this new water supply many women are developing goiter, and what was for a long time an immune district has now become an endemic goiter region.

In an incomplete survey of Iron County, Dr. M. J. Mcfarlane reports that approximately 44 per cent of school children in the grades have goiter, and Dr. O. Sundwall reports that goiter is very prevalent in Sanpete County. The capriciousness of the geographical distribution of goiter is indicated by a report from Dr. Curtis, who found 6 per cent in school children of Payson and 67 per cent in school children of Santaquin, two towns only six miles apart.

Unfortunately, no comprehensive data of goiter incidence is available, though such information is being obtained by various agencies.

Of our own 213 cases embraced in this report, there is a distinct tendency to incidence in certain distinct valleys, though the majority of the counties in the State are represented, and a number have come from adjoining States.

These observations are isolated and not controlled, but suggest that in this Rocky Mountain region the next few years may develop facts of importance in the knowledge of goiter.

Although this sparsely settled intermountain country does not furnish materials for large goiter clinics, as the Great Lakes country does, we have our due proportion, and our experience shows that the same principles as to causation, variety, percentage of toxicity, and results of greatment obtain with us as with other people.

During the last two and a half years we have seen and treated 213 cases of the various types of goiter, not including hypothyroidism or the inflammatory conditions. Of these, 75 were of the toxic variety and 138 of the non-toxic type. Of these cases, 111 were treated surgically, 128 operations, including ligations, being performed on them. The remainder, largely of the colloid type, were not operated.

SURGICAL MORTALITY

Upon these 111 cases, 111 thyroidectomies and 17 ligations were performed. There were no deaths from ligation, and two deaths, or 1.8 per cent, from the thyroidectomies.

Sixty-nine per cent of these cases were toxic, and many of them extremely toxic. Of the two deaths, one was a case of simple goiter developing tracheal collapse some hours after the operation. Apparent symptomatic improvement detered us from doing the tracheotomy which might have saved her life. The other fatal case was a severely toxic one which failed to respond in the least to weeks of rest and medical treatment. As she was going from bad to worse, the operation was done as a last resort.

In this series there were two cases so toxic we dared not operate them. One of these cases refused to submit to a long period of preoperative treatment, and died later after operation at the hands of another surgeon. The other died in the hospital without operation, showing marked gastrointestinal symptoms, with jaundice and cardiac failure.

RESULTS OF SURGICAL TREATMENT

Of these 111 operated cases, we have been able to secure reports from 70 cases at intervals after operation varying from two months to two and a half years. In the big majority of the cases the results were striking and the patients most grateful. Nothing more dramatic has occurred in our experience than the physical and mental change that comes over the subject of hyperthyroidism in the few weeks following a successful thyroidectomy. One sees the woman who was an emaciated nervous wreck, with palpitating heart and trembling hands, transformed into a normal person,

with vitality restored and the joy of living reflected from her countenance.

The replies from these 78 patients may be summarized as follows:

	No. of Cases
Cured of goiter—health entirely restored	38
Greatly benefited	18
Benefited	13
Benefited, but some return of goiter	1
Died after operation	2
Unable to secure report	22
Not improved	3
Too recent to report	11

Gain of weight was striking in the successful cases, averaging 20 pounds; one gained 60 pounds.

Of the three cases that claimed no improvement, one, although gaining in weight, complained of menorrhagia and suffered from focal infection in tonsils and sinuses, and the other two had complicating conditions which marred the picture.

A few of the cases reporting moderate or marked improvement from thyroid surgery were still not in perfect health. It is our impression that focal infection, which in the borderline thyroid cases may make the thyroid diagnosis doubtful, may persist after a successful thyroidectomy and prevent a perfect return to health. No post-operative goiter case presenting signs of focal infection should be allowed to get entirely away from observation until the bacterial focus has been cared for.

PREOPERATIVE PREPARATION

We have come to feel that the most important factors in preparation for operation are a period of rest in bed and fluids to the limit of the absorbing power of the patient. We give calcium carbonate for the possible prevention of post-operative tetany. More recently, following the lead of Plummer, we have been giving Lugol's solution, but the period of its use has been too short to arrive at any conclusions as to its value. Except in those cases showing objective cardiac failure, preoperative digitalization has seemed of little value. In one case with non-paroxysmal auricular fibrillation quinidine was used to restore normal rhythm before operation.

SURGICAL TECHNIQUE

In the very toxic cases we attach considerable importance to the form of deception first announced by Crile, of taking the patient to the operating-room under the anesthetic, without letting her know that she is to be operated. We have tried operating in the patient's room, but have concluded that, unless one is doing enough of the very hazardous cases to develop good team work with the force on the floors, it is better to take the little extra time and transport the patient to the operating-room.

Following the lead of Crile, we have used the method of giving the amount of nitrous oxide gas and oxygen to produce analgesia, and supplementing with ½ of 1 per cent novocain used locally. The patient is thus carried through the operation without loss of consciousness, except possibly for a brief period of time when each separate lobe is being elevated.

We have nearly always divided the neck muscles transversely, and believe we get the best exposure in that manner.

We are convinced that safety in operating on the thyroid depends upon a few fundamental things: First, careful selection and preoperative preparation of the patient; second, thorough comprehension of the anatomy, and third, good team work on the part of the operating force.

In the "Wild West" we used to speak of men who were "quick on the trigger." Only that type of mentality which is quick on the trigger should attempt goiter surgery.

We have had our full share of the hemorrhagic type of goiter, and I know of no condition that can make a greater demand upon the alertness and resourcefulness of a surgeon. To have tissues crumble at every touch, and well out blood in an avalanche from every conceivable point, is a spectacle to try the stoutest heart. We have only two suggestions to make to the surgeon confronted with such a predicament; first, the almost reckless disregard of consequences in dislocating the lobe from its bed, and second, after dividing the isthmus, to mattress through from side to side each separate bloc of tissue before separating it from its posterior attachment.

We believe that the frequent observation of blood pressure and the general condition of the patient, by a competent observer, throughout the operation, has enabled us to stop in time several operations where life was threatened by shock or hemorrhage; in these cases gauze-packing was applied, and the operation not completed until the next day.

We feel sure that this procedure has materially lessened our mortality.

As we look over our own results, we do not seem to have gotten such striking improvement from preliminary ligation as one is led to expect from a perusal of the literature. In fact, considering the added complication of adhesions, and the delay and expense to the patient, I am convinced that primary thyroidectomy would have been better in a number of our cases. Of course, some of them are so bad that one turns to anything that will break the brunt of a difficult shock-producing operation. But we shall do more primary thyroidectomies in the future.

POST-OPERATIVE COMPLICATIONS AND TREATMENT

Post-operative hemorrhage has been infrequent, but occasionally serious enough to lead us to have all suspected cases typed for transfusion prior to operation. Hyperpyrexia has occurred in only two cases; here the application of chopped ice and copious intravenous fluid infusion seemed of great value. Tetany in greater or less degree occurred in three or four cases. Calcium seemed to control the symptoms at once, and there was no serious consequence. Paroxysmal auricular fibrillation has been not infrequent. Quinidine has been of value in its treatment. In one case an apparently permanent fibrillation occurred after operation; normal rhythm was restored by quinidine, and is maintained six months after operation.

Perhaps the most interesting condition after

operation is that described of late as hypoglycemia. In five cases this clinical picture developed. The urines showed the presence of much acetone and diacetic acid. Unfortunately, at this time we had not begun to make blood sugar or carbon dioxide determinations, but the relief from intravenous glucose, as in the Johns Hopkins cases, was very striking.

NON-OPERATIVE TREATMENT

In a few cases of toxic goiter we have tried X-ray treatment, but without much effect. The medical treatment of the non-toxic (colloid) type in young people by means of iodine has been very gratifying, in a few cases surprisingly large goiters melting away. But we learned that we were too impatient for quick results, and that cases apparently not improved at first would show great improvement if seen a few months later.

We are much interested in the preventive work done by Marine and Kimball, and adopted more recently by the Swiss Government. Heber J. Sears, of the Department of Hygiene and Preventive Medicine of the University of Utah, is going into a survey of three of our most involved counties, and a detailed effort will be put forth to adopt Marine's plan of prevention.

T. B. Beatty, chairman of the State Board of Health, is bringing an expert from the Rockefeller Institute to make a survey, and take into consideration a campaign for the application of preventive measures.

Maccarison has said that 5 per cent of children born of goitrous mothers will be cretin imbeciles. We are recommending all pregnant women to take the same small preventive quantity of iodine that we are giving school children, in the belief that in this way some cases of imbecility may be avoided, and the unborn child may be started on its course with a properly functioning thyroid.

We are fully aware of the fact that in these sparsely settled districts we cannot speak with the authority that comes from the study of large numbers of cases, but so far as our experience goes we are essentially in accord with the deductions drawn from the larger studies. We are zealous advocates of the surgical treatment of all forms of toxic goiter, and of all those which will likely become toxic, or which otherwise are pathological. We are also enthusiastic over the preventive treatment and of the medical treatment of goiters which are not surgical, especially in children and young adults.

Left Superior Cervical Sympathectomy Under Local Anesthesia in Angina Pectoris—In the case reported on by Jay Harvey Bacon, Peoria, Ill. (Journal A. M. A., December 22, 1923), there has been effected a complete relief from all severe symptoms. The results have justified the means used in this case, and Bacon regards the operation as a justifiable procedure in those severe cases of angina pectoris that do not respond to rest and diet and the administration of nitrites. The incision over the anterior border of the sternocleidomastoid muscle gives a quick easy approach, and it may be safely attempted under local anesthesia when the condition of the patient will not justify the use of a general anesthesia.

SPONTANEOUS PERIRENAL HAEMATOMA

CASE REPORT WITH COMMENT

By LEON JOSEPH ROTH, M. D., Los Angeles

J. B., male, age 48, cement worker by trade, entered St. Vincent's Hospital, Los Angeles, December 29, 1922, complaining of severe back pains and recurrent presence of blood in the urine. He was thin and cachectic and so weak he could barely walk.

Temperature, 98.6; pulse, 110; respirations, 22; blood pressure, S-112 D-100; blood count, reds 3690000; whites, 18285-14628. Hemoglobin, 60-65.

Past History — Usual diseases of childhood, typhoid fever and rheumatism. The arthritis is now becoming more noticeable in the elbow-joints. About ten weeks ago he was given serum treatment for rheumatism, which caused some digestive disturbances and vomiting. Patient denies venereal diseases. Cervical lymphatics (presumably tuberculous) have been removed. Fracture of the skull, 1919, is reported by the patient. Apart from these conditions he has been in fairly good health and has been doing light work. Although previously constipated, he has had diarrhea for the past few days. Appetite poor due to alleged stomach disorders. Sleeps poorly. Does not drink, smoke, or use drugs.

Chief Complaint—Dull and continuous pain in small of back on both sides for past three weeks. Pain does not radiate, usually appearing toward evening, persisting through the night and disappearing about daybreak. No associated nausea or vomiting, although has had emesis independently of pain. He does not know when blood first appeared in the urine. He says urine has been clear at times, and at other times there is a recurrent "total" haematuria. Denies any trauma whatsoever. There is no dysuria. Nocturia, previously absent, has persisted since beginning of back pains. Apart from this no further definite information is obtainable. The more or less constant complaint is of very severe pain in the lumbar and left hypochondriac regions.

Physical Findings — Pupils dilated, slightly irregular, but react readily to light and accommodation. All teeth out; scars on both sides of neck from previous adenophathies, and one large anterior cervical lymphatic present. Chest symmetrical, good expansion; resonant throughout; no rales, No enlargement of the heart. Sounds loud and regular; slightly roughened first sound at apex, not transmitted; aortic second sound markedly accentuated, probably due to arteriosclerosis. There is decided muscular resistance and tenderness in the epigastric region and left hypochondrium; soreness along the spines of lumbar vertebra. The knee-jerks, tricipitals, bicipitals, and achilles are absent. Babiniski reaction not present; Wassermann reaction negative. A working diagnosis of malignant kidney was made.

Progress Record—The patient was kept under observation to note the persistence of haematuria and pain and secure the temperature record. On